

CLAIMS:

1. Nanoparticles for use in imaging or in radiation treatment of biological material, the nanoparticles comprising a VUV or UV-C emitting material which absorbs high energy radiation and emits VUV or UV-C radiation, said nanoparticles being conjugated to a bio-target specific agent.
- 5 2. Nanoparticles as claimed in claim 1, for use in radiation therapy.
3. Nanoparticles as claimed in claim 1, wherein the high energy radiation is X-rays.
- 10 4. Nanoparticles as claimed in claim 1, wherein said bio-target specific agents are antibodies or antibody fragments.
5. Nanoparticles as claimed in claim 4, wherein the antibodies or antibody
15 fragments have a specificity for a diseased tissue.
6. Nanoparticles as claimed in claim 1, wherein the UV emitting material of the nanoparticles is provided with a covering layer.
- 20 7. Nanoparticles as claimed in claim 6, wherein the covering layer prevents hydrolysis of the UV emitting material.
8. Nanoparticles as claimed in claim 1, wherein the VUV or UV-C emitting material is one or more substances selected from the group: -, $M_2SiO_5:X$, $MAIO_3:X$,
25 $M_3Al_5O_{12}:X$, $MPO_4:X$, $MBO_3:X$, $MB_3O_6:X$ with $M = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi, Nd$ or any of $MM'O_3:X$ with $M = Y, La, Gd, Lu$, $M' = Y, La, Gd, Lu, Bi$ and $X = Pr, Ce, Bi$ or any of $MSO_4:Z$ with $M = Sr, Ca$ and $Z = Nd, Pr, Ce, Pb$ or any of $LuPO_4:Nd$, $YPO_4:Nd$, $LaPO_4:Nd$, $LaPO_4:Pr$, $LuPO_4:Pr$, $YPO_4:Pr$, $YPO_4:Bi$.

9. Nanoparticles as claimed in claim 1, wherein the VUV or UV-C emitting material is a trivalent phosphate.
- 5 10. Nanoparticles as claimed in claim 1, wherein the nanoparticles are doped with an activator.
11. Nanoparticles according to claim 10, wherein the activator has a decay time shorter than 100ns.
- 10 12. Nanoparticles as claimed in claim 10, wherein said activator is Pr^{3+} or Nd^{3+} .
13. The use of nanoparticles as an imaging agent or a radiation treatment
15 agent, the nanoparticles comprising a VUV or UV-C emitting material which absorbs high energy radiation and emits VUV or UV-C radiation.
14. The use of claim 13, in the manufacture of an imaging agent or a
radiation therapy agent.
- 20 15. The use as claimed in claim 13, wherein the high energy radiation is X-rays.
16. The use as claimed in claim 13, said nanoparticles being conjugated to a
25 bio-target specific agent.
17. The use as claimed in claim 16, wherein said bio-target specific agents are antibodies or antibody fragments.
- 30 18. The use as claimed in claim 17, wherein the antibodies or antibody fragments have a specificity for the bio-target.

19. The use as claimed in claim 13, wherein the UV emitting material of the nanoparticles is provided with a covering layer.
20. The use as claimed in claim 19, wherein the covering layer prevents
5 hydrolysis of said UV emitting material.
21. The use as claimed in claim 13, wherein the VUV or UV-C emitting material is one or more substances selected from the group: $M_2SiO_5:X$, $MAIO_3:X$, $M_3Al_5O_{12}:X$, $MPO_4:X$, $MBO_3:X$, $MB_3O_6:X$ with $M = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi, Nd$ or any of $MM'O_3:X$ with $M = Y, La, Gd, Lu, Bi$, $M' = Y, La, Gd, Lu$, and $X = Pr, Ce, Bi$ or any of $MSO_4:Z$ with $M = Sr, Ca$ and $Z = Nd, Pr, Ce, Pb$ or any of $LuPO_4:Nd$, $YPO_4:Nd$, $LaPO_4:Nd$, $LaPO_4:Pr$, $LuPO_4:Pr$, $YPO_4:Pr$, $YPO_4:Bi$.
22. The use as claimed in claim 13, wherein the UV emitting material is a
15 trivalent phosphate.
23. The use as claimed in claim 13, wherein the nanoparticles are doped with an activator.
- 20 24. The use as claimed in claim 23, wherein said activator is Pr^{3+} or Nd^{3+} .
25. A method of treatment of a human or an animal patient by: providing nanoparticles according to claim 1, administering the nanoparticles to the patient, and irradiating the patient with high energy radiation.